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THE SHADDOCK TREE.

[Shaddock-Tree.]

THE Shaddock (*Citrus decumana*) is one of the four distinct or leading species into which the orange tribe of plants is divided. The shaddock is larger than the orange, both in the tree and the fruit. The tree has spreading prickly branches: the leaves are egg-shaped and rather acute, and the leaf-stalks are furnished with remarkably large heart-shaped wings: the flowers are white, with reflexed petals, and very sweet-scented. The fruit, which is from two and a half to eight inches in diameter, is spheroidal, of a greenish yellow colour, and has twelve or more cells, containing, according to the variety, either a red or white pulp. The juice is sweet in some varieties, and acid in others; it is rather insipid, but is excellent for quenching thirst. The rind, which is of a disagreeable bitter flavour, is very thick, in consequence of which the fruit can be much longer preserved during sea-voyages than that of any other species of citrus.

The shaddock is a native of China, and the neighbouring countries, where the name of "sweet ball" is given to it. Its common name is derived from Captain Shaddock, who brought it from China to the West

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Indies. It has, however, been neglected there, and is now but seldom entitled to its oriental name of sweet-ball. Instead of propagating the shaddock by budding, as is done in China, and which is the only way it can be improved, or even kept from degenerating, they have reared it from seed, and have in consequence only obtained a harsh and sour sort of little value. The shaddock came to England from the West Indies, and was cultivated by Miller in 1739. In the West it is certainly the least valuable of the genus to which it belongs; and for the attention which it has received it is chiefly indebted to the showiness both of the tree and the fruit. In its native country the fruit attains a much greater size than in the West. Thunberg says that it is commonly of the size of a child's head in Japan; Dr. Sickler describes it as weighing fourteen pounds, and as having a diameter of from seven to eight inches. Their accounts are confirmed by Bishop Heber, who thus describes the shaddock of India:—"The shaddock resembles a melon externally, but it is in fact a vast orange, with a rind of two inches thick, the pulp much less juicy than a common orange, and with rather a bitter flavour, certainly a fruit which would be little valued in England, but which in this burning weather I thought rather pleasant and refreshing*." The shaddock has been recently sold in London under the name of "forbidden fruit."

MARRIAGES IN RUSSIA.

Russia is one of those countries in which the parties more immediately interested have little to do in the formation of matrimonial connexions. Marriages are generally negotiated through the intervention of friends; and the parents, of the female in particular, usually decide who is to be her husband, with little reference to her own inclinations. This custom probably proceeds, in a great measure, from the early age at which marriages are commonly contracted in this country; for it seems to be thought that young people may be trusted with the important relations of married life before they are fit to be trusted with the selection of the person who is to form the centre of those relations. The consequences of such a system are often very unhappy, although less frequently so, perhaps, than might happen in countries where parents relinquish, sooner than in Russia, all control over their children. It is among the lower classes that very early marriages are the most common; and from the peculiar situation of the Russian peasant, and the state of the country in general, such marriages cannot be considered so imprudent, in a worldly point of view, as they would be in a country so highly civilized and so populous as our own. Housekeeping is attended with little expense, and the young pair commonly live with the parents of the husband until the united families become too large to be accommodated under one roof. It is a rule among the common people to avoid becoming dependant on their children; and therefore the parents—or the surviving parent, even if the female—retain the management of the household entirely in their own hands till death. The laws of the country, indeed, are more than usually favourable to widows and mothers.

In the higher and middle classes of society,—if we may be allowed, for a moment, to speak of a middle class in Russia—the wife does not fill a position which offers any marked difference from that which wives in the corresponding ranks of life generally occupy in the other nations of Europe. But the wives of the peasantry are much less favourably situated than those of a similar station in this country. The behaviour of the husbands may generally be characterised as rough and austere, according to our notions. The females work hard, and are commonly obliged to be quiet spectators of the intemperance and irregularities of their husbands, seldom venturing to expostulate or complain. To this, however, there are many and beautiful exceptions; and, judging from his personal impressions, the writer considers that as much domestic happiness is often realised among the lower classes in Russia as a fair consideration of the condition of the people authorised him to expect.

The betrothing, which is performed with ecclesiastical rites, and is itself indissoluble, generally takes place eight days previous to the marriage. During this interval, the bride is only visited by the bridegroom, and by the girls of her acquaintance, who exert themselves to amuse her, particularly by singing. On the day previous to the nuptials, these females conduct the bride to the bath, and there spend much time in dressing and plaiting her hair, all the while singing songs descriptive of the happiness of married life.

The following account of the actual marriage ceremony, between a couple in good circumstances, is principally derived from a detailed account given in Dr. Granville's 'St. Petersburgh.'

At the appointed time, a large number of friends of the parties having previously assembled in the church, the priest, attired in rich vestments, and attended by a deacon, proceeded down the church from the altar to the door, where he received the candidates for matrimony. After he had delivered to each a lighted taper, and made the sign of the cross three times on their foreheads, he conducted them to the upper part of the nave. The bride was attended by young ladies in splendid dresses, and incense was scattered before them as they advanced. The priest, as he went, recited a litany, in which the choristers assisted, and, at its conclusion, halted before a table, on which the rings were deposited: then, turning towards the altar, with the bride and bridegroom behind him, he repeated a short and very impressive prayer, or invocation. After this, he turned round to the couple and blessed them; and then taking the rings from the table, gave one to each, proclaiming, in a loud voice, that they stood married to each other, "now and for ever, even unto ages of ages." This declaration he repeated three times, the bride and bridegroom exchanging rings at each declaration. The rings were then again surrendered to the priest, who, after having crossed the foreheads of the young couple with them, placed them on the fore-finger of the right hand of each. He then again turned towards the altar and read another impressive part of the service, in which allusion is made to all the passages of the Bible in which a ring is mentioned as the symbol of union, honour, and power.

After this, the priest took both the parties by the hand and led them towards a silken carpet, which lay spread upon the ground. This is, to the mass of the spectators, a moment of the greatest interest; for it is firmly believed that the party which first steps upon the carpet will have the mastery over the other throughout life. "In the present instance," says Dr. Granville, "the bride secured possession of this prospective advantage with modest forwardness."

Two silver imperial crowns were then produced by a layman and received by the priest, who, after blessing the bridegroom, placed one of these ornaments upon his head; the other was merely held over the bride's head, in order that the superstructure raised by a fashionable hair-dresser of St. Petersburgh might not be deranged.

After the crowning, a cup was brought to the priest, who, after drinking from it himself, gave it to the bridegroom, who took three sips and then delivered it to the bride, by whom the same ceremony was repeated. After a short pause, other prayers were recited, and, these being concluded, the priest took the pair by the

* Narrative of a Journey, vol. i. p. 3.

hand and walked them three times around the desk, reciting some sentences. Then, taking off the bridegroom's crown, he said,—"Be thou magnified, O bridegroom, as Abraham! Be thou blessed as Isaac, and multiplied as Jacob, walking in peace, and performing the commandments of God in righteousness."

In removing the bride's crown, he said,—"And be thou magnified, O bride, as Sarah! Be thou joyful as Rebecca, and multiplied as Rachael; delighting in thine own husband, and observing the bounds of the law, according to the good pleasure of God."

After this, the tapers were extinguished, and taken from the bride and bridegroom, who were then dismissed by the priest with his blessing, and received the congratulations of the company and saluted each other. Dancing and feasting continues for three days after the wedding, and on the eighth day the parties again repair to the church, when the priest performs the ceremony of "dissolving the crowns," with appropriate prayers, in allusion to the rites of matrimony.

In furnishing the account which we have thus condensed, Dr. Granville describes what he actually witnessed, and considers that other accounts, so far as they differ from this, are "exaggerated or fanciful." This is one of those hasty statements by which travellers, who have witnessed an observance in only one aspect, perplex their readers by impugning the statements of others, who may have seen the same thing, and correctly described it, in another of its forms. The wedding at which this author was present took place in that class of society which the soonest relinquishes those peculiar usages that form the most prominent external characteristics of a nation. An earlier witness of a marriage in the same class of society may have seen peculiarities which do not at present come under notice, but which are still to be found among the lower classes,—the mass of the nation,—among whom the beard and the peculiar national dress is still retained. This explanation is worth the few lines we have given to it, because its application goes much beyond the present instance, or the present subject.

Taking the above, therefore, as a correct representation of the marriage observances in that part of the population which has already relinquished many of the national peculiarities, we now recur to less recent sources of information for an account of some observances which were formerly in use even in this class of society, and most, if not all, of which are, to our own knowledge, still retained among the humbler classes of the people.

The evening previous to the wedding, the female, properly attended, went to the bridegroom's house, taking with her bridal apparel and a bedstead. This article was always provided by the bride, and, in proportion to the means of her family, was usually an article of some cost. The woman's mother, and female friends or servants, remained with her all that night; and the bridegroom was bound to keep himself out of the way. This usage is mentioned by Dr. Giles Fletcher, who was in the country in the reign of Elizabeth, and whose observations are recorded in 'Purchas his Pilgrimes.' It probably arose from the very natural desire of the bride to ascertain the accommodations of his future habitation. It still exists in a form more or less modified.

The same may be said of another usage, described by the same writer in the quaint dialect of the time:—"After the ceremony the bride cometh to the bridegroom and knocketh her head upon his shoe, in token of her subjection and obedience; and the bridegroom again casteth the lap of his gown or upper garment over the bride, in token of his duty to protect and cherish her." The actual prostration is now, we believe, generally commuted into a motion towards it.

The ceremony of the carpet, mentioned by Dr. Granville, is apparently a softened form of the usage thus described by Anthony Jenkinson who was in Russia about the middle of the sixteenth century. He is describing what happens in the church after the pair have been actually united.

"They begin to drink, and first the woman drinketh to the man, and when he hath drunk, he letteth the cup fall to the ground, hasting immediately to tread upon it; and so doth she, and whether of them tread first upon it must have the victory and be master at all times after, which commonly happeneth to the man, for he is readiest to set his foot upon it because he letteth it fall himself."

When they leave the church, it is the most orthodox practice for the parties to separate and go to the houses of the respective parents, where they respectively entertain their personal friends; but it has now become increasingly frequent for both to go and spend the day at the house of the bride's parents. The Russian church does not require the presence of the parents at the marriage of their children. They remain to receive them when they come home, and, as they approach, throw corn out of the windows upon them, "in token," says Giles Fletcher, "of plenty and fruitfulness to be with them ever after." It is now more usual, however, for the father of the bride to present the young couple, on their return, with bread and salt, accompanied with a fervent wish that they may never know the want of either. In the evening, the bride is conducted to the house of her husband, or of his father; and an old regulation, not now so much insisted upon as formerly, rendered it indecorous for her to speak, except a few words at table, during the first three days of her married life.

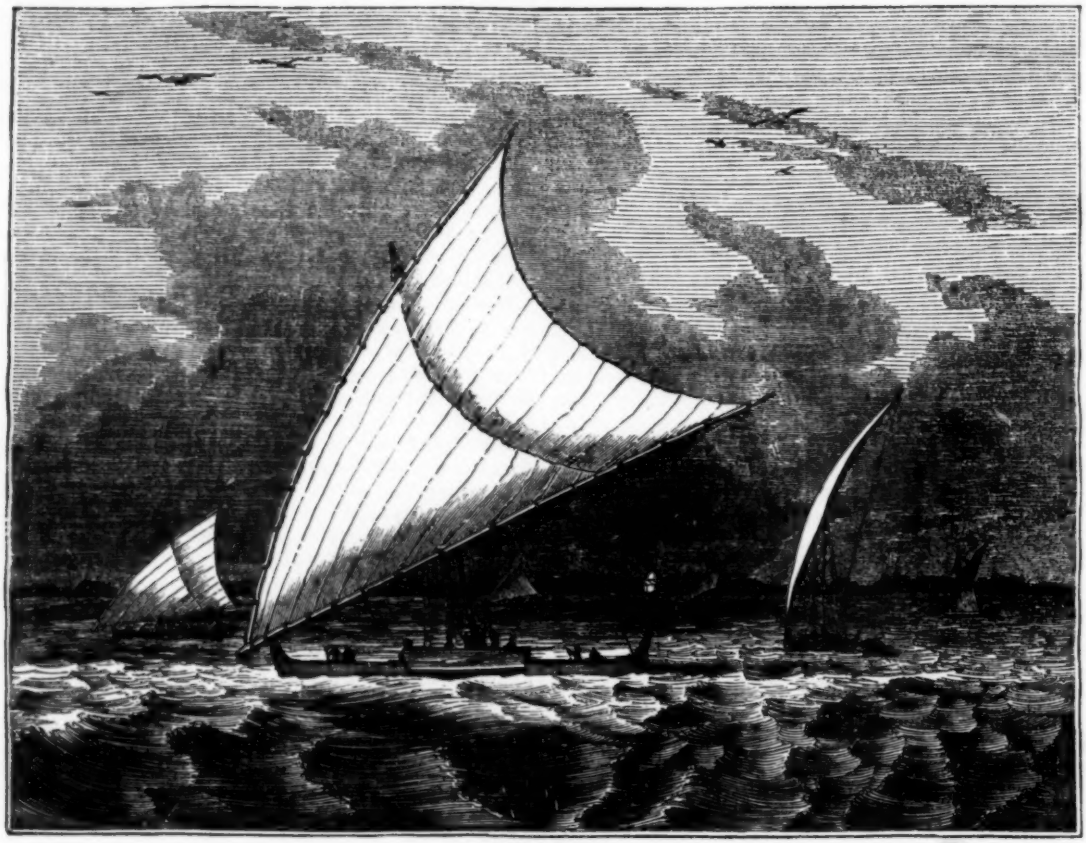
The custom of making presents to a new-married pair is carried to a considerable extent in Russia; and, when the parents are in good circumstances, and have large connexions, the bride is sometimes so loaded with gifts that a large room is filled with them. These benefactions are, for the time, exhibited in a collected form, with considerable pride.

It only remains to add, that second and third marriages are not much approved in Russia, and fourth marriages are entirely forbidden.

Character of a Sot.—A sot has found out a way to renew, not only his youth, but his childhood, by being stewed, like Æson, in liquor; much better than the virtuoso's way of making old dogs young again: for he is a child again at second hand, never the worse for the wearing, but as purely, fresh, simple, and weak, as he was at first. He has stupified his senses by living in a moist climate. * * * He measures his time by glasses of wine, as the ancients did by water-glasses; he is like a statue placed in a moist air; all the lineaments of humanity are mouldered away, and there is nothing left of him but the rude lump of the shape of a man, and no one part entire. He has drowned himself in a butt of wine, as the Duke of Clarence was served by his brother. He has swallowed his humanity, and drunk himself into a beast. He is like a spring-tide: when he is drunk to his high-water mark, he swells and looks big, runs against the stream, and overflows everything that stands in his way; but, when the drink within him is at ebb, he shrinks within his banks, and falls so low and shallow, that cattle may pass over him.—*Samuel Butler.*

The Red Mullet.—The generic term, *Mullus*, by which this fish is distinguished, is said to have reference to the scarlet colour of the sandal worn by the Roman consuls and emperors, which was called *mulleus*. The mullet was held in extraordinary estimation by the Romans. One of six pounds' weight is recorded to have produced a sum equal to 48*l.*; one still larger 64*l.*; and even 240*l.* were given for three of very unusual size, procured on the same day, for a repast of more than usual magnificence.—*Yarrell's British Fishes.*

THE PROA.



[Indian Proas.]

The vessel represented in the engraving belongs to a class peculiar to the East Indian seas, more especially to the cluster called the Ladrones, and other adjacent islands. As the term *proa* in Spanish is equivalent to the English *prow*, both signifying the head or fore part of a ship, the primary expression from which they are derived conveying the idea of "that which projects or stretches forward," it is probable that the Spaniards bestowed the name *proa* on these vessels from their singular construction. Both bow and stern are alike, so that, by only shifting the sail, the vessel can sail backward or forward, without putting about.

Magellan, who discovered the archipelago to which he gave the name of *Islas de los Ladrones*, or islands of the thieves, because the natives evinced a pilfering propensity in their intercourse with his people, simply remarks concerning the boats of the islanders, that their canoes are oddly contrived and patched up, *yet sail with wonderful rapidity*. As the name *proa* was applied of course subsequently to the discovery of the islands, the inference is natural enough that it was so applied during the early intercourse of the Spaniards with the natives.

A particular description of the proa is given by the writer or writers of 'Anson's Voyage round the World.' Speaking of the Indians who inhabit the Ladrones, it is said, that "they are no ways defective in understanding, for their flying proa, in particular, which has been for ages the only vessel used by them, is so singular and extraordinary an invention, that it would do honour to any nation however dexterous and acute. Whether we consider its aptitude to the particular navigation of these islands, or the uncommon simplicity and ingenuity of its fabric and contrivance, or the extraordinary velocity with which it moves, we shall find it worthy of our admiration, and meriting a place amongst the mechanical productions of the most civilized nations, where arts and sciences have most eminently flourished.

"The name of *flying proa* given to these vessels is owing to the swiftness with which they sail. Of this the Spaniards assert such stories as appear altogether incredible to those who have never seen these vessels move. However, from some rude estimates made, by our people, of the velocity with which they crossed the horizon at a distance whilst we lay at Tinian*, I cannot help believing that with a brisk trade-wind they will run near *twenty miles an hour*. Which, though greatly short of what the Spaniards report of them, is yet a prodigious degree of swiftness.

"The construction of the proa is a direct contradiction to the practice of the rest of mankind. For as the rest of the world make the head of their vessels different from the stern, but the two sides alike, the proa, on the contrary, has her head and stern exactly alike, but her two sides very different; the side, intended to be always the lee-side, being flat; and the windward-side made rounding, in the manner of other vessels. And to prevent her oversetting, which, from her small breadth and the straight run of her leeward-side, would, without this precaution, infallibly happen, there is a frame laid out from her to windward, to the end of which is fastened a log, fashioned into the shape of a small boat, and made hollow. The weight of the frame is intended to balance the proa, and the small boat is

* Tinian, one of the Ladrones or Marian islands, is celebrated from the pleasing description given in Anson's 'Voyage' of its salubrity and agreeableness,—but the description is exaggerated, arising doubtless from the rapid recovery of the crew, previously exhausted and almost worn out.

by its buoyancy (as it is always in the water) to prevent her oversetting to windward; and this frame is usually called an outrigger. The body of the proa (at least of that we took) is made of two pieces joined endways, and sewed together with bark, for there is no iron used about her. She is about two inches thick at the bottom, which at the gunwale is reduced to less than one.

"The proa generally carries six or seven Indians; two of which are placed in the head and stern, who steer the vessel alternately with a paddle, according to the tack she goes on, he in the stern being the steersman; the other Indians are employed either in baling out the water which she accidentally ships, or in setting and trimming the sail." From this description of these vessels it is sufficiently obvious how dexterously they are fitted for ranging the collection of islands called the Ladrones. For as these islands lie nearly north and south of each other, and are all within the limits of the trade-wind, the proas, by sailing most excellently on a wind, and with either end foremost, can run from one of these islands to the other and back again, only by shifting the sail, without ever putting about; and by the flatness of their lee-side, and their small breadth, they are capable of lying much nearer the wind than any other vessel hitherto known. Our engraving has been made from a drawing by W. Westall, A.R.A., who, when he took the sketch from the deck of Captain Flinders's ship, was surprised to see these proas sail right round the vessel in which he was, although that was sailing at a very rapid rate.

The ingenuity of these islanders, as shown in the construction of these vessels, has enabled them to take advantage of their position on the surface of the globe. Sir George Staunton, in his account of 'Lord Macartney's Embassy to China,' observes, that "the Ladrones, and clusters of islands between them and the southern extremity of China, are so near to each other and to the main land, and are also so broken, as well as so irregular in their form and position, as to appear like fragments disjointed from the Continent, and from each other, at remote periods, by the successive violence of mighty torrents, or of some sudden convulsions of nature." Thus the roughness of the coasts of these islands, on which the waves break with fury, combined with their position with respect to the trade-winds, drove the natives to verify the adage that "necessity is the mother of invention." Their pilfering habits, which annoyed Magellan (as well as subsequent navigators), and obtained for them the odious appellation of Ladrones (thieves or robbers), arose probably from the very same liveliness of fancy and curiosity which led to their improvement on the ruder and perhaps original form of the canoe, as seen at other places. These islands are also termed Marian Islands, in honour of Mary Anne of Austria, queen of Philip IV. of Spain, and mother of Charles II., who, as regent, during the minority of her son, sent jesuits and soldiers to convert the natives. They were also termed "Islas de las Velas" (Islands of the Sails), from the great number of proas which usually put out to meet any ship which might anchor there.

MINERAL KINGDOM.—Section XXXVIII.

Silver.

This metal, when free from mixture, is of a pure, brilliant white colour, and perfectly free from taste or smell. It is so soft as to be easily scratched by copper; but it is nevertheless capable of receiving a high polish by burnishing, inferior only to steel. But polished silver, when exposed to the air, soon becomes tarnished, as is well known: this depends, of course, upon the nature of the atmosphere, and takes place most quickly where coal is burned, or when, by any other means, sulphur gets dissolved in the air: for the tarnish of silver is not an oxide of the metal, but a sulphuret. This is well illustrated when we eat eggs with ungilt silver spoons, for sulphur is contained in the white of an egg; and mustard-spoons are often tarnished, because mustard is frequently adulterated with flowers of sulphur: the effect is, perhaps, also caused by the sulphur which is a constituent part of that peculiar principle contained in mustard, called *sinapisin*. This liability to be blackened by sulphureous vapours renders silver unfit for architectural decorations, or for any purposes where it cannot be readily cleaned. Its specific gravity, when hammered, is 10·51; and it is therefore somewhat lighter than lead. It is considerably elastic, and when hardened by an alloy is highly sonorous. In point of malleability it is next to gold, and is capable of being beat into leaves of $\frac{1}{160,000}$th part of an inch in thickness. It is also, after gold, the most ductile of the metals, for it may be drawn into wire more slender than the finest human hair, and in this way a single grain may be stretched out to 400 feet. In tenacity it is inferior to iron, copper, and platinum wire of the tenth part of an inch in diameter supporting a weight of 240 lbs. It is fusible in a moderately intense red heat, corresponding, according to Mr. Daniel, to 1873° of Fahrenheit's scale: a plate about the dimensions of very thin pasteboard will scarcely support the full heat of a very brisk fire in a common grate, and when intensely heated it is volatilized. It is what is called a perfect metal, that is, it does not form an oxide by exposure to air and moisture; but when it is fused in an open vessel, it absorbs oxygen in considerable quantity, amounting sometimes to twenty-two times its volume; but it parts with the whole of it again in the act of becoming solid, and Gay Lussac attributes to that circumstance the peculiarly beautiful aspect of granulated silver. If silver in the form of leaf or fine wire be intensely heated by means of electricity, galvanism, or the oxy-hydrogen blowpipe, it burns with vivid sparks, and with an exquisite green-coloured flame, and gives out a dense grey smoke.

Silver is found not only native, that is, in the pure state, but in combination with other substances, forming a great variety of ores. When pure it is sometimes met with in regularly-formed crystals, and it traverses rocks in the form of veins of various dimensions, and is found in insulated masses in rocks. These last are sometimes of great size; as for instance, in one of the mines of Peru a lump of pure silver was discovered which weighed 800 lbs. It is related that in the seventeenth century a mass of native silver was found at Kongsberg, in Norway, which weighed 560 lbs. The mines of Freiberg in Saxony have often produced masses of 100 lbs. weight. There are about twenty-five different varieties of silver ore; the most common are the following:—*Sulphuret of silver*, consisting of about 80 per cent. of the metal, and 20 of sulphur; *red silver ore*, containing about 57 per cent. of silver, 15 of sulphur, 16 of antimony, and 12 of oxygen; *muriate of silver*, containing 68 per cent. of silver, 26 of muriatic acid, and 6 of iron; and *antimonial silver*, consisting of about 84 per cent. of silver, and sixteen of antimony. But a large proportion of the silver brought to market is obtained from the ores of other metals, in which silver is a subordinate ingredient, but which, on account of its great value, it is profitable to extract even when occurring in minute quantity. Thus the silver in lead ore is sometimes separated with profit when it exists only to the extent of eight ounces in the ton of lead; which is only one part in 1481, or a single grain of silver in more than half-a-pound of lead. The ore called galena contains,

in general, more silver than any other lead ore. The lead formerly found on Brunghill Moor in the district of Craven, in Yorkshire, contained about 230 ounces of silver in the ton, and that of the mines near Plinlimmon, in Cardiganshire, worked in the reign of Charles I., yielded eighty ounces in the ton. The average proportion contained in the lead of the north of England is twelve ounces to the ton.

The silver ores, properly so called, are found chiefly in veins which traverse the primary and the older of the secondary stratified rocks, more especially the former, and also the unstratified rocks, such as granite and porphyry, which are associated with these. The rich mine of Guanaxuato in Mexico, and the still more celebrated one of Potosi, on the confines of Peru, are situated in primary slate. Among the transition strata, limestone is the richest in silver, but grauwacke is also very productive; the rich mines of Zacatecas in Mexico are in that rock. The celebrated mines of Real Catorce, and others near Zimapan, in Mexico, and those of Pasco and Hualgayoc, in Peru, are in Alpine limestone, supposed to correspond in geological age to the magnesian limestone of England, (L, diagram in No. 51) which rests upon a conglomerate or pudding-stone rock; and in the district of Mexico, on the western slope of the Cordilleras, there are mines in a still more modern secondary deposit, one supposed to be analogous in point of age to the Jura oolite limestone (I), and the veins are more productive in that rock than in the primary strata on which it reposes. Among the unstratified rocks, the porphyries of Mexico are in general very rich in silver, and a vein of it occurs in the variety of granite called syenite at Comanja, in the district of Guanaxuato. In Europe, the workings for silver are sometimes, as in Saxony, in a multitude of slender veins; sometimes, as at Clausthal in the Hartz Mountains, and at Chemnitz in Hungary, in a small number of spots, where the veins are of great dimensions. In the three richest districts of Mexico, viz., Guanaxuato, Zacatecas, and Real del Monte, they have only one principal vein, worked in different places. The vein of Guanaxuato is of extraordinary dimensions, from 130 to 148 feet wide, and it has been traced and worked along an extent of nearly eight miles. It is a remarkable circumstance that while gold is so constantly found in grains in alluvial soils, *stream-silver* is almost unknown. Silver is not destructible, in its native state, by exposure to air and moisture, and that source of the disappearance of the ores of the baser metals cannot apply in this case, and native silver is of sufficiently common occurrence to have afforded lumps and grains when the rocks containing it were broken down, as seems to have taken place as regards gold. The inferior value of silver would not pay the labour of collecting, unless it existed in a far greater proportion in the alluvial soils, than stream-gold does, even in the mining districts.

The processes for obtaining the pure metal from the ore are very various; depending upon the nature of the foreign ingredients with which it is combined. Mechanical division, roastings to separate the sulphur and other volatile matter, meltings at different stages of purification, with the addition of fluxes of different sorts, form the essential parts of nearly all. The last of the operations, that of refining, is performed in one of the two ways we have already described in treating of gold; viz., *amalgamation*, by means of the great affinity which quicksilver has for silver, and the easy separation of the two metals afterwards, by simply distilling off the quicksilver, or *cupellation*, by means of the readiness with which lead combines with oxygen, and by which it is thus separated from the silver, which has a much less affinity for it, at the same time combining with the other baser metals.

The great supply of silver to the rest of the world is from the mines of Mexico and South America. The riches of these mines is immense; and, far from having diminished, they have gradually augmented in produce for three centuries. All the silver mines of Mexico are situated near the summit, or on the western flank of the Cordilleras, the range of mountains which runs through the centre of the country; and the greatest number, as well as the most productive of them, are situated between the 18th and 24th degrees of latitude. They are in general at moderate elevations above the great table land; but that table land is from 5600 to 8000 feet above the level of the sea. The highest mines are at an elevation of 9800 feet; but the climate, even in that high region, is mild and salubrious. At the time of Humboldt's visit there were about 500 mining establishments, containing about 3000 miners, and from 3000 to 4000 veins or masses were worked. These mining establishments are called *Reales;* thus we have the Real Catorce, the Real del Monte, &c.

The ores of silver most commonly met with in Mexico are the sulphuret, the antimonial, and the muriate. Native silver is not sufficiently abundant to be reckoned among the productive ores, but it usually accompanies the sulphuret. Sometimes masses of it of great size have been found, as at Batopilas in New Biscay, where one weighing 442 lbs. was met with. The variety of sulphuret of copper, called grey copper, is of frequent occurrence, and contains so much silver as to be considered one of the most productive of the silver ores; and there is an earthy ore called *colorados* in Mexico, and *pacos* in Peru, which is an intimate mixture of minute particles of native silver, and muriate of silver, with brown oxide of iron. A great deal of the silver of Mexico is extracted from lead ore. At Real del Monte, a sulphuret of iron yields 22 ounces of silver in the quintal, or 102 lbs. Some of the ores are extremely rich. The antimonial ore of Sombrerete yielded in six months 432,274 troy pounds of silver, equal to about 1,300,000*l.* in value, in a working of not more than 100 feet. In the mine of Valenciana, in the district of Guanaxuato, there were, in 1791, some ores which contained 168 ounces in 102 lbs.; but there were others which were so poor as not to yield more than three ounces; the average being only nine ounces in that same mine. It is supposed that the mean richness of all the ores of Mexico is not greater than from three to four ounces in the quintal of ore. The mines of Peru are not richer on the average, and the famous mine of Potosi is not so much so; for its average produce is no more than $1\frac{6}{10}$ in the quintal. The average produce of all the mines of Saxony is from three to four ounces in the quintal; so that the great quantity of silver yielded by the Mexican mines is owing to the great facility with which they are worked, and to the enormous quantity of the ore, and not to its intrinsic value.

REMARKS ON THE RELATION BETWEEN EDUCATION AND CRIME.

The above is the title of a judicious pamphlet by Dr. Francis Lieber, which has recently been published at Philadelphia, in the United States, by the Society for Alleviating the Miseries of Public Prisons. As the observations it contains are of universal application, and especially as they appear to have been called forth by statements which have been made in this country as to the supposed inefficacy of education in preventing an increase of crime, we have judged it advisable to furnish our readers with an abstract of Dr. Lieber's useful paper.

It has been stated, in both Houses of the British Parliament, that education is far from causing a de-

crease of crime, and the circumstances of the United States have been adduced in evidence of the alleged fact. In one case, it had been asserted that official information had been received from the city of New York, which would satisfactorily prove the accuracy of this position. Some remarks of Messrs. de Beaumont and de Tocqueville, in their work on the Penitentiary System of the United States, with respect to the apparent increase of crime in the State of Connecticut, had also been referred to as confirming this statement, which, if true, would disappoint the promoters of public instruction in one of their fondest hopes.

Under these circumstances, Dr. Lieber felt it of much importance that, if it were really practicable, an answer should be given to this statement, to obviate the bad effect it was calculated to have on the minds of many, and the evil it might produce in society by damping the zeal of the friends of education both in America and Europe, particularly as the results at which some able and acute statistical writers have arrived appear in some instances to sanction such unfavourable conclusions.

He commences by stating that he thinks the difference of opinion respecting the effect of education upon the decrease of crime is owing, in no slight degree, to a vagueness of expression, so common when a subject of great importance begins to attract general attention. Perhaps many writers do not connect a perfectly clear and definite idea with an expression so simple as that of "increase" or "decrease of crime." The terms "education," "instruction," "knowledge," and several others are used still more vaguely. In order, therefore, to proceed with perspicuity, it is necessary to affix a distinct idea to the several terms, knowledge, instruction, education, and civilization.

By *instruction* will be understood the imparting of knowledge, and is used by Lieber to signify public instruction, or the imparting of knowledge in schools, more especially in such schools as are established according to some general system, and strive to diffuse knowledge among those classes which are least able to procure instruction by private means. *Education* has a much more comprehensive meaning, and signifies the cultivation of the mental, moral, and physical faculties of the young. It therefore includes instruction. By *civilization* is understood the cultivation of all our powers and endowments, and whatever results from this cultivation, as well as the cultivation of all those ideas which have a connection with man's existence, as a member of civil society, or as a social being in general, as well as the adorning of his mind.

After some forcible remarks in proof that progressive civilization is the destiny of man, Dr. Lieber addresses himself to answer the question,—Does civilization promote crime? Civilization, as defined, certainly cannot be said to promote crime; yet it is admitted that an increased number of crimes will necessarily be connected with a state of increased civilization, simply because civilization multiplies, with every advancing step, the opportunities for the application of man's activity, and therefore the opportunities for its abuse. It multiplies the desires and wants of man, which is in fact one of the most desirable effects of civilization; but, together with them, it multiplies disappointments, and will always, with some individuals, create the desire of gratifying these wants by any means, whether honest or not.

But if it be thus granted that civilization multiplies the opportunities of crime, it must be admitted, on the other hand, that a universal attention to public instruction is the result of a general progress in civilization, which seldom fails to cause, at the same time, two things—first, as already explained, multiplied opportunities for crime, and, secondly, an improved state of the administration of justice, as well as of the police, which detects the deviations from the law. It would be difficult to find a government which watches with great zeal over public instruction and promotes it throughout the country that does not direct a proportionate attention to the other branches of administration. Thus it frequently happens that the introduction of a general school-system is accompanied by an increased number of convictions in the courts of justice; and cursory observers, who do not penetrate to the true causes of this phenomenon, hastily infer that the one is the cause of the other, or, at all events, that the former does not operate in producing a decrease of the latter. But in order to ascertain the true effect of general instruction we should guard against rash conclusions, and take for examples countries of large extent, in which universal instruction has been established for a number of years,—such as Prussia*,—rather than refer to those in which no thorough effect can as yet be expected, or which are so small that casual occurrences, entirely foreign to the amount of criminality in the community, may essentially disturb the usual proportion of crime and population.

It is evident that education, according to the definition which has been given, cannot possibly promote crime, unless a man be so bold as to assert that man's nature is so thoroughly bad, that, in whatever way it may be cultivated, if cultivated at all, it shoots forth the germs of its seeds of corruption—a view which would be repugnant to our conceptions of the goodness as well as wisdom of the Creator. But the question is, whether universal instruction is conducive to a decrease of crime? meaning thereby, as it is commonly understood, universal instruction in the various elementary branches of knowledge. Now, such knowledge, or, indeed, any knowledge, is in itself neither good nor bad: it has no moral character of its own. Arithmetic will assist a defaulter as much as an industrious man who works for his family, as a knife may serve the murderer as well as him who cuts a piece of bread with it for a crippled beggar. But if we come to speak of public instruction, knowledge does not retain a character so entirely indifferent.

It has often been remarked that instruction without the careful culture of the heart leads to immorality rather than to morality. This is undoubtedly true. Domestic education—the rearing of the young in sound morality—the fear of God—and the all-important example of virtue in their parents before their eyes—are of vital importance to every society; and can never be supplanted by any general school-system, however wisely it may be contrived. Suppose, however, domestic education in general, or with large classes, to be bad, and not only to continue thus from generation to generation, but, as there is nowhere a mental or moral standing still, to grow worse and worse, would not the school be one of the most natural means to correct this state of things, and gradually to introduce a better one? If the moral domestic education is not bad, instruction is not the less necessary. As to the alleged neglect of this important part of education in schools, the objection, if of any weight, points rather to the higher sorts of schools than to those established on a general system for the benefit of the less favoured classes of the community, who may be presumed most likely to suffer from the want of adequate moral discipline at school in consequence of being less likely to find it at home. Perhaps there is hardly a school, even the meanest, in which a child does not receive some moral instruction which may importantly influence his ultimate character and habits. A teacher cannot help

* It is stated, among other particulars, in an Appendix, that, in the years 1828-1831, an *increase* of 3 per cent took place in the population; and there was, in the same period, a corresponding *decrease* of 3 per cent in the number of indictments against children under 17 years of age.

enforcing some moral rules, by way of keeping order in his school-room; nor can the lessons which the children have to read and learn remain without instilling some moral precepts into the mind, or disposing it better for the reception of moral and religious views. Besides, there is in all knowledge, even in the most indifferent as to moral effects,—for instance, arithmetic,—a softening power, which renders the mind more pliable; and, however inferior it may be in itself, forms one more link which connects the individual with the society in which he lives. The more we can cultivate this feeling of being linked to a society of moral beings, and to a nation in which, like others, we have duties to perform; and the more we can prevent the growth of a feeling of separation from society, or of opposition to the rest of society, the more we shall also prevent the various acts of selfishness—of absorbing egotism—of crime.

Dr. Lieber next adverts to a consideration which, if the increase of crime simultaneously with the diffusion of education were admitted, would alone, perhaps, be sufficient to account for it. This part of the subject deserves to be considered with great attention. It is, that there are no individuals more exposed to crime than those who remain ignorant in a civilized community; or, in other words, those individuals who are touched by the wants and desires of civilization, or by the effects of general refinement, without being actually within the bosom of civilization. Ignorance, without civilization, is no peculiar source of crime; ignorance, with civilization, is an abounding source of crime, both because it lessens the means of subsistence, and because it lowers the individual in the general and his own esteem—it severs him from the instructed and educated. Instances are afforded to us in the lowest, most ignorant, and destitute classes in all large cities, who receive certain views and notions of civilization, and yet live without education and instruction. We have arrived at a state of things in which an individual who cannot read, is actually, in most respects, excluded from the great sphere of civilization; and whoever is thus excluded from the general course of civilization, is more exposed to misery, and more liable to be drawn into the snares of crime than others who are more firmly linked to society, and upon whom, therefore, shame has a greater power; and who, moreover, find it easier to gain a livelihood in an honest way.

After stating such considerations as these, Dr. Lieber returns to urge the fallacy of the assumed test for estimating the effect of education upon crime, by comparing the proportion between crime and population, since public instruction has been established in a given country, to that which before existed. The increase of crime, or, in other words, the increase of convictions, is a very unsuitable test of the increased criminality of a community, unless we are enabled, from a number of concurrent circumstances, to judge more precisely of the case. Sometimes the police has been more vigilant, sometimes the laws have been made more proportionate to the crime, and individuals have consequently been more ready to prosecute; sometimes a great influx of destitute persons has taken place, at others public attention has been roused and directed to certain crimes until then neglected; an army may have been disbanded—a winter may have been peculiarly severe—a season of scarcity may have existed, money transactions may have afforded new opportunities, &c.; in short, a number of causes, some of which are continually exercising their influence upon mankind, may have existed without the least connexion with public instruction; nay, the latter may have continued to exercise its beneficial influence during the whole time that crime was increasing, and may actually have prevented it from still greater excesses.

With regard to the alleged increase of crime in the city of New York and in the United States at large, Dr. Lieber has no materials which could authorize him to make any definite statement on the subject. He is rather inclined to think it may be true, but accounts for it on some of the above grounds. Not a little of this effect at New York must be attributed to the influx of European rogues, vagabonds, and homeless adventurers to that great sea-port town. Generally, also, something may be attributed to the more frequent practice now than formerly of giving in newspapers full details of criminal trials and transactions. It is necessary that such cases should be noticed; but the full statement of particulars is a practice which is fraught with evil. It satisfies one of the worst cravings of the human mind, and affects it in turn in the same way in which physical stimulants and exciting liquors satisfy, and in turn ruin the body; it has a tendency to render the reader callous, and it has a positive and evil effect upon criminally-disposed persons. Dr. Lieber wishes that the editors of the more respectable papers would set the example, and abstain from furnishing those detailed accounts which he considers so injurious.

But all other causes which operate in producing crime, are inferior in effect to intemperance. We have lately shown that intemperance has not increased in *this* country; and are therefore unable to argue that any supposed increase of crime here has resulted from the extension of intemperate habits. Nevertheless, the effect of intemperance in producing crime remains the same; because not only its tendency is to lower the character and render it habitually depraved, but because a large proportion of crimes are committed by persons under the actual influence of intoxication. But although we cannot assign any increase of crime to increase of intemperance in England, and thus help to exculpate the cause of education from the charges it has so undeservedly incurred, we can do what is quite as good; we can claim for education in connexion with the more general diffusion than at any former time of good principles and useful knowledge, the merit of having prevented the increase of intemperance, and even of having effected a diminution in the aggregate amount. We are firmly persuaded that the same causes will continue to operate in producing the same effect—namely, the diminution of intemperance, and therefore of crime. Dr. Lieber says that in the United States a great increase of intemperance took place some years since, and is now showing its melancholy effects on the intemperate themselves, as well as on those who in the mean time have grown up with such pernicious examples before them. The apparent increase of crime in England must be looked for in some of the other causes to which we have before adverted, particularly the increased efficiency of the police, and the greatly softened character of the criminal laws, producing together a greater facility in the discovery and punishment of crime than ever before existed. The increase in the number of convictions, beyond the proportional increase of population, does not imply any actual increase in crime; but only that more crime has been detected. We doubt that there has been any *actual* increase of crime within the last ten years; we rather apprehend there has been a diminution.

Then, it may be asked, is there really no test by which the effect of education in preventing crime may be estimated? There is one very important test to which we purpose, still following Dr. Lieber's pamphlet, to call the attention of our readers in a future Number.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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